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XXI. *A Letter to the Astronomer Royal, from Samuel Holland, Esq. Surveyor General of Lands for the Northern District of America, containing some Eclipses of Jupiter's Satellites, observed near Quebec.*

Kittery, Piscataqua River, Oct. 18, 1770.

S I R,

Redde, Jan. 20,  
1774.

I Would have taken the liberty, of troubling you with a letter before I left Quebec; but being in hopes of making some observations at my arrival here, to join with those I now inclose, made at Quebec since I had the honor of transmitting to you my last, I deferred it till now, and am sorry to inform you, I have had no success with Jupiter's satellites, and must wait till after the conjunction of that planet with the Sun; when I shall use all my endeavours, to supply my losses that way, this season, through the badness of the weather, my travels, and the survey.

Agreeable to your desire, I have here inclosed, Mr. Sproule's observations, made at GASPEE, with the steps he took relative thereto (which, I hope, will enable you to determine the longitude of his place of observation) with those of mine made at St. JOHN's island, and QUEBEC, which will be of great service to the business I have the honour to be entrusted with.

Z 2

I have

I have now materials for forming a general map of our surveys of the gulph and river St. LAWRENCE, and with the assistance of Mr. Desbarre's surveys, employed by the Admiralty, I shall be able to bring my map as far as CAPE SABLE, the Southwest point of the peninsula of NOVA SCOTIA.

Mr. Wright is surveying the N.E. part of that province, and will be obliged to winter in those parts. Mr. Sproule is now employed in surveying CASCO BAY, and from thence continues his operations towards the bay of FUNDY; while I am busy in defining this harbor, river, and the sea coast, from CAPE ELIZABETH TO CAPE ANNE, where Mr. Wright will begin next spring, on his return from the Gulph of St. Lawrence; so that I hope to complete the survey of the Northern district in a few years more; when I shall reduce our work to general maps and charts, with the exact latitudes, and, with your assistance, the longitudes also, determined from our observations, compared with yours.

Our survey of places and harbors of note, is by a scale of 2000 feet to an inch, and the other parts by 4000; after which it is reduced to a scale of two statute miles to an inch, or better than  $8\frac{6}{1000}$  inches to a degree of latitude. These maps I purpose making on a globular projection, considering the earth as a sphere.

As, by the time I hope to receive your determination of the longitudes of the above places, I shall be ready for composing my first map, I shall be greatly obliged to you for your opinion of the most useful and exact globular projection for a space contained between the 37th and 51st parallels of latitude,

tude, and between the 53d and 78th degrees of longitude; which projection may equally serve for the separate maps, I may find it convenient to make of different parts of my district, as well as of the whole of it, which is comprehended in this space: but those charts intended for the use of the navy I shall compose on Wright's or Mercator's projection.

Mr. Wright has had an opportunity, last spring, of rectifying the latitude of the island of COUDRE, where he observed the transit of Venus, of which he has acquainted you: I had likewise an opportunity, on my way to this place, to rectify the latitude of St. JOHN's island, at the entrance of PORT JOY, where I made my observations in 1765, as I had, at that time, no other instrument, but an astronomical quadrant, of the old construction; which I found to be very erroneous, when I compared it with BIRD's, on its arrival at Louisburg, some time afterwards: Mr. Wright and I, from very careful observations with this last instrument, have now determined the latitude of the place, where my observations were made in 1765, by reducing it from Fort Amherst, the place we now observed at, to be  $46^{\circ} 11' 0''$  North.

It gave me great satisfaction, to have an opportunity of examining BIRD's astronomical quadrant, last year, in New-York province, in determining the latitude of  $41^{\circ}$ , for settling the boundary line, between that colony and New Jersey, with the same instrument. Messrs. Mason and Dixon used for determining the boundary line between Pennsylvania and Maryland: on this occasion, Mr. RITTENHOUSE,

an esteemed astronomer and ingenious mechanic of Pensylvania, made use of it, and I, of BIRD's; when we never found them to differ more than  $17'$ , which surprized that gentleman much, to find an instrument, of such small dimensions, executed with that accuracy, as to equal so nearly his large zenith instrument, which also is of BIRD's workmanship.

I have found the latitude of the entrance of this harbor to be  $43^{\circ} 5' 0''$ , though it is in general laid down in  $43^{\circ} 20'$ , and, in some maps,  $26'$ : and for the charts of these coasts, they have but little resemblance to what they should express.

How Mess. Wright and Sproule came to neglect the equation of correspondent altitudes, I cannot otherwise account for, but, that they must have wanted tables to work by; as before they went on these observations, I had made use of M. DE LA LANDE's tables, and before I was master of his, I used those calculated by M. MARALDI, which, though not so exact as the former, are very near.

Mr. Sproule's reason for bringing his observations to equal or mean time, was for convenience, as the timepiece he had, constructed by MUDGE and DUTTON, was easily brought to it, and is made on the same principles with that time piece, I always use, constructed by the late Mr. GRAHAM, which keeps going for a month, and, when winding up, continues going by a spring.

M. ST. GERMAIN, a priest of the Roman church, and who is stiled, in the seminary, *Le professeur en philosophie*, had been some time with me, practising himself in the use of the telescope, at Jupiter's satellites; and, some days before the transit, he was frequently

trying the position he ought to be in, when that phenomenon should by your calculation come: I think he perceived the contact before me, but was fearful to call out too soon; for he could not have taken the signal from me, as he was some distance off; and I did not call out, but when I observed it, gave a signal, by a squeeze, to a gentleman standing near, by which time he called. In regard to the luminous point, which, I think, I saw just before the contact, I am at a loss to account for it; unless something may be urged, from my not having that part of the Sun's disc exactly in the middle of the field of my telescope.

Your favor, directed to me at Portsmouth in New Hampshire, I shall receive with the greatest regard. I am,

S I R,

Your most obedient humble servant,

SAMUEL HOLLAND.

ECLIPSES OF JUPITER'S SATELLITES,  
 observed by me, at my house, bearing South  $36^{\circ}$   
 West from QUEBEC, distance from the castle of  
 ST. LEWIS  $2\frac{1}{2}$  miles, with DOLLOND's long re-  
 fracting telescope.

1770.	Mean time.					
	h.	'	"			
Apr. 19	14	5	21	immersion of the	2d	} fatellite.
May 1	12	42	32	— — —	1ft	
14	12	5	30	— — —	2d	
				not exact to 4" thro' the thick- ness of the atmosphere.		
21	13	41	30	— — —	2d	
24	12	52	20	— — —	1ft	